

Project Details

ROSES ID: NNH10ZDA001N

Selection Year: 2011

Program Element: Focused Science Topic

Topic: Low-To Mid-Latitude Ionospheric Irregularities and Turbulence

Project Title:

Towards a Predictive Capability for Equatorial Plasma Bubble Locations

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Summary:

Equatorial plasma bubbles are among the most important elements of space weather because of their impact on telecommunications. Concrete steps towards an ability to predict the occurrence and location of such irregularities is a key goal of the Living With a Star Focus Science Topic A. The three key elements of such a forecast are the prediction of the onset, growth and motion of a plasma bubble. This study will address the third of these, which has received comparatively little attention in recent years. We propose a short study of just 2 years in order to address this. Our group has already performed the critical preliminary work and developed all of the tools and the database that will be needed to ensure success in a timely manner. The product of this work will be a new empirical model of the drift velocity of plasma bubbles derived from IMAGE-FUV observations. This model will be a critical element for future forecasting and will provide a new benchmark for theoretical and numerical modeling efforts.

Publication References:

Summary: no summary

Reference: England, S. L.; Immel, T. J.; (2012), An empirical model of the drift velocity of equatorial plasma depletions, Journal of Geophysical Research: Space Physics, Volume 117, Issue A12, doi: 10.1029/2012JA018091

Summary: no summary

Reference:

Liu, Guiping; England, Scott L.; Frey, Harald U.; Immel, Thomas J.; Lin, Chin S.; Pacheco, Edgardo E.; Häusler, Kathrin; Doornbos, Eelco; (2013), Comparison of drift velocities of nighttime equatorial plasma depletions with ambient plasma drifts and thermospheric neutral winds, Journal of Geophysical Research: Space Physics, Volume 118, Issue 11, pp. 7360-7368, doi: 10.1002/2013JA019329